REMARKS

Claims 1-36 were pending in the application. The non-final Office Action dated August 28, 2008 rejects claims 1-36.

This paper amends claims 1, 22-24, and 32, cancels claims 3, 4, 10, and 11, and adds new claims 37 and 38. Applicant is not conceding that the subject matter encompassed by claims 1, 3, 4, 10, 11, 22-24, and 32 prior to this Amendment is not patentable over the art cited by the Examiner. Claims 1, 22-24, and 32 were amended and claims 3, 4, 10, and 11 were canceled in this Amendment to facilitate expeditious prosecution of the application. Applicant respectfully reserves the right to pursue claims, including the subject matter encompassed by claims 1, 3, 4, 10, 11, 22-24, and 32 as presented prior to this Amendment and additional claims in one or more continuing applications.

Claims 1, 2, 5-9, and 12-38 are now pending in the application.

Claim Rejections under 35 U.S.C. §102

The Office Action rejects claim 22 under 35 U.S.C. §102(e) as being anticipated by Touzov (US Publication No. 2004/0115830). Applicant respectfully traverses the rejection to the extent it is maintained against claim 22 as amended.

Applicant's invention, as now set forth in independent claim 22, recites an apparatus for moving droplets, comprising a liquid phase on a surface, a droplet disposed in the liquid phase, a light source producing a focused beam of light, and means for directing the focused beam of light into direct contact with the droplet disposed in the liquid phase causing the droplet to heat and a thermal gradient to form within the droplet sufficient to induce the droplet to

move within the liquid phase.

Touzov teaches a method of moving a microdroplet based on the Marangoni effect. The method uses focused laser beams positioned over a specific region of a microfluidic device, on the surface of a substrate upon which a droplet sits. Notably, the droplet is not disposed within a liquid phase, unlike the applicant's invention in claim 22 as now claimed. The laser beam moves in a spiral, thus creating a rotating thermal field with a temperature gradient that moves the droplet into the center of rotation.

Unlike the applicant's invention, however, Touzov does not teach or suggest directing the beam of light into direct contact with the droplet, as set forth in the applicant's claimed invention. Rather, Touzov teaches that the "radiation interacts only with [the] surface of [the] substrate" (paragraph [0170], underlining added). It is evident, then, that Touzov is inducing movement by heating the substrate surface upon which the droplet sits, not by directing the light beam into direct contact with the droplet. Thus, in Touzov temperature gradients that induce the droplets to move form in the substrate surface; in contrast, in the applicant's invention the thermal gradient sufficient to move a droplet forms within the droplet. Therefore, because Touzov neither discloses nor suggests the "liquid phase" in which the droplet is disposed or directing the beam of light "into direct contact with the droplet", as now set forth in the applicant's claimed invention, Touzov cannot anticipate or render obvious the applicant's claimed invention. Applicant respectfully requests that the rejection be withdrawn.

Claim Rejections under 35 U.S.C. §103

The Office Action rejects claims 1, 2, 4-6, 8-10, 12, 16, and 17-21 under 35 U.S.C. §103(a) as being unpatentable over Velev (US Publication No.

2004/0211659) in view of Touzov. Applicant respectfully traverses the rejection to the extent it is maintained against the claims as now amended.

Applicant's invention, as now set forth in independent claim 1, recites providing a liquid phase on a surface. A droplet is dispensed into the liquid phase. The liquid phase is immiscible with the droplet. A focused beam of light is directed into direct contact with an edge region of the droplet in the liquid phase causing the droplet to heat and a thermal gradient to form within the droplet sufficient to induce the droplet to move in the liquid phase.

Velev teaches suspending a particle in a liquid composition and subjecting the particle to an electric field gradient that causes the particle to move. Unlike the applicant's claimed invention, Velev does not use a focused beam of light to heat the particle, nor use temperature gradients to move the particle. Rather, the fundamental principle of operation for transporting the particle in Velev is the electric field gradient (see Abstract).

To recreate the applicant's invention, the Office Action suggests substituting Touzov's temperature gradient technique for Velev's electric field gradient technique. In effect, the Office Action is proposing a change to Velev's fundamental principle of operation for moving a particle -- from the use of electric field gradients to the use of temperature gradients. This is a drastic alteration to Velev's principle of operation; it completely alters the nature of the physics involved in the particle movement. However, as stated in the MPEP § 2143.01 VI, a proposed modification cannot change the principle of operation of the reference, and "if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." Applicant respectfully submits that this change in the nature of the physics of Velev's principle of operation, from electric field

gradients to temperature gradients, is evidence that the teachings of these references are insufficient to render that applicant's claims obvious.

Moreover, the proposed combination still fails to teach or suggest every limitation of the applicant's invention as now claimed. As previously noted, Touzov does not direct the focused beam of light "into direct contact with the droplet", as set forth in the applicant's claims. And Velev has nothing to do with the use of focused light to heat and move a particle. Hence, any combination of Velev and Touzov still lacks directing the beam of light "into direct contact with the droplet", as now set forth in the applicant's claimed invention. Therefore, applicant respectfully requests that the rejection be withdrawn.

Each of dependent claims 2, 4-6, 8-10, 12, 16, and 17-21 depends directly or indirectly from patentable independent claim 1 and incorporates all of its respective limitations and, therefore, is patentably distinguishable over the cited references for at least this reason. Moreover, each dependent claim also recites an additional limitation, which, in combination with the elements and limitations of its independent claim, may further distinguish that dependent claim from the cited references. Therefore, applicant respectfully requests the withdrawal of the rejection of these claims.

The Office Action also rejects claim **11** under 35 U.S.C. §103(a) as being unpatentable over Velev in view of Touzov, and further in view of Garnier (Optical Manipulation of Microscale Fluid Flow, Garnier et al.), claims **13** and **28** as being unpatentable over Velev and Touzov and Touzou alone, and further in view of Wolke (US Patent No. 6,539,956), claims **23-27, 29,** and **32-36** as being unpatentable over Touzov in view of Velev, claims **14** and **30** as being unpatentable over Velev and Touzov and Touzov, and further in view of Baer (US Patent No. 6,469,779), and claims **3, 7, 15,** and **31** as being unpatentable

over Velev and Touzov and Touzov, and further in view of Kulin et al. (Optical Manipulation and Fusion of Liposomes as Microreactors). Applicant respectfully traverses these rejections because each of these rejected dependent claims depends from one of the patentable independent claims 1 and 22, and incorporates all of its limitations and, therefore, is patentably distinguishable for at least those reasons provided in connection with that independent claim. Therefore, applicant respectfully requests that the rejection be withdrawn.

New Claims

Each of the newly added dependent claims 37 and 38 depends from one of the patentable independent claims 1 and 22, and incorporates all of its limitations and, therefore, is patentably distinguishable for at least those reasons provided in connection with that independent claim. Support for the new claims can be found in FIG. 1 and FIG. 2 and in paragraph 23 of the published application.

CONCLUSION

Applicant submits that this paper provides a response for all pending claims. Any absence of a reply to a specific rejection, issue, or comment, or to any taking of official notice or reliance on common sense, however, does not signify agreement with or concession of that rejection, issue, comment, taking of official notice, or reliance on common sense. In addition, because the arguments made above are not exhaustive, there may be reasons for patentability of any or all pending claims that have not been expressed.

In view of the amendments and arguments made herein, Applicants submit that the application is in condition for allowance and request early favorable action by the Examiner.

If the Examiner believes that a telephone conversation with the

applicant's representative would expedite allowance of this application, the Examiner is cordially invited to call the undersigned at (508) 303-0932.

Respectfully submitted,

Date: February 18, 2009
Reg. No. 41,274

/Michael A. Rodriguez/
Michael A. Rodriguez
Attorney for applicant
Guerin & Rodriguez, LLP
5 Mount Royal Avenue
Marlborough, MA 01752

Fax No.: (508) 303-0005
Tel. No.: (508) 303-0932